

What Is Claimed Is:

1. A bone screw comprising:
a thread section of elongated tubular construction with an outer wall and having a first end and a second end;
a tip at the first end; and
an elongated holding element connected to the thread section at the second end, the holding element comprising a first section for connection to the second end of the thread section and an elongated rod-like second section having a longitudinal length and a free end opposite the first section;
wherein the tubular thread section further comprises a bone thread on the outer wall and the outer wall of the thread section contains a plurality of recesses forming a mesh-like open network; and wherein the bone screw is dimensioned such, that the bone screw can be fully immersed in the opening created when screwing in.
2. A bone screw according to claim 1, further comprising a stop for limiting a distance of insertion of the holding element into the thread section.
3. A bone screw according to claim 1, wherein the thread section further comprises a first internal thread section at its second end and the first section of the holding element comprises an external thread for cooperation with the first internal thread section.
4. A bone screw according to claim 1, wherein the second end of the thread section and the first section of the holding element are structured and arranged to cooperate for connection in the form of an interference fit.

5. A bone screw according claim 1, further comprising an engagement element at the free end of the holding element for cooperation with a screw-in tool.

6. A bone screw according to claim 1, wherein the holding element further comprises a stop located between the first section and the second section to prevent further penetration of the holding element into the thread section.

7. A bone screw according to claim 5, wherein the stop comprises a shoulder.

8. A bone screw according to claim 1, wherein the thread section further comprises a stop located on the inside of the outer wall to prevent further penetration of the holding element into the thread section.

9. A bone screw according to claim 1, further comprising a nut, and wherein the rod-like section of the holding element further comprises a second external thread at the free end for cooperation with the nut.

10. A bone screw according to claim 1, wherein the thread section further comprises a second internal thread section at the first end.

11. A bone screw according to claim 1, wherein the first internal thread section extends over the whole length of the thread section and the tip is structured and arranged to cooperate with the first internal thread section.

12. A bone screw according to claim 1, wherein the first internal thread section comprises a metric or an inch thread.

13. A bone screw according to claim 1, wherein the tip is structured and arranged as a self-tapping tip.

14. A bone screw according to claim 1, wherein the tip comprises a cannula.

15. A bone screw according to claim 14, wherein the holding element comprises a cannula.

16. A bone screw according to claim 1, wherein the holding element comprises a cannula.

17. A bone screw comprising:

a thread section of elongated tubular construction with an outer wall and having a first end and a second end, the outer wall containing a plurality of recesses forming a mesh-like open network;

a tip at the first end; and

an engagement element at the second end capable of cooperating with a screw-in tool;

wherein the thread section further comprises:

a bone thread on the outer wall and having a first length;

an adjoining section free of bone thread and having a second length, the adjoining section comprising the second end of the thread section; wherein the diameter of said section free of bone thread is dimensioned such that the bone screw can be fully immersed in the opening created when screwing in.

18. A bone screw according to claim 17, wherein the engagement element comprises an internal thread section at the second end that cooperates with a screw-in tool.

19. A bone screw according to claim 17, wherein the engagement element comprises an internal thread section at the second end, and the bone screw further comprises a driving element that cooperates with the engagement element and further cooperates with a screw-in tool.

20. A bone screw according to claim 17, wherein the engagement element comprises an internal thread section at the second end, and the bone screw further comprises a fixation element that cooperates with the engagement element for fixing the bone screw.

21. A bone screw according to claim 17, wherein the second length of the adjoining section is the same as or greater than the first length of the bone thread section.

22. A bone fixation device comprising a bone screw according to claim 1, a plate for fixation of a bone, the plate comprising a recess through which the free end of the rod-like section of the holding element can be passed, and a nut for cooperating with the holding element to fix the plate.

23. A bone fixation device comprising a bone screw according to claim 1 and a marrow nail for fixing a bone, the marrow nail comprising a recess through which the free end of the rod-like section of the holding element can be passed.

24. A holding element for cooperation with a bone screw, wherein the bone screw comprises an elongated tubular construction having a first end, a second end, a tip at the first end and a connecting element at the second end for connection to the holding element, the holding element comprising a first section for connection to the bone screw and an elongated rod-like second section having a length; and wherein the holding element is dimensioned such that it can be at least partly introduced in the opening created by the bone screw when screwing in.

25. A holding element according to claim 24, further comprising a stop for limiting a distance of insertion of the holding element into the bone screw.

26. A holding element according to claim 24, wherein the bone screw comprises an internal thread section at its second end and the first section of the holding element comprises an external thread for cooperation with the internal thread section.

27. A holding element according to claim 24, wherein the connecting element and the first section both are structured and arranged to cooperate to provide an interference fit between the bone screw and the holding element.

28. A method for repairing a bone having a fracture, the method comprising:

- providing a bone screw in accord with claim 1;
- fully introducing the bone screw into the bone and positioning the bone screw at the place of fracture; and
- attaching a fixation device to the holding element.

29. A method according to claim 28, further comprising shortening the holding element to avoid unnecessary protrusion beyond the fixation plate.

30. A method according to claim 28, wherein before attaching the fixation device, the method further comprises:
removing the holding element from the bone screw;
applying a filler material into the interior of the thread section of the bone screw; and
reconnecting the holding element to the thread section.

31. A method according to claim 28, wherein the fixation device comprises a plate or a marrow nail.